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Bonded abrasive grain sizes

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Descriptors : abrasives, particle size distribution, grain size, determination of content

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS R 6001** : 1987 is replaced with **JIS R 6001** : 1998.
The purposes of this revision are to make the standards on the macrogrit and the microgrit for general bonded abrasives conform to the corresponding International Standards.

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

Bonded abrasive grain sizes

Introduction This Japanese Industrial Standard has adopted the grain sizes of the macrogrit and the microgrit for general bonded abrasives, which have been specified in the first edition of **ISO 8486-1**, *Bonded abrasives—Determination and designation of grain size distribution—Part 1 : Macrogrits F4 to F220*, and of **ISO 8486-2**, *Bonded abrasives—Determination and designation of grain size distribution—Part 2 : Microgrits F230 to F1200* published in 1996, without any modification of technical contents, and additionally has specified the grain size of fine powder for precision polishing which has not been specified in the corresponding International Standards.

In this Standard, the "portions" underlined with dots are the items which are not specified in the corresponding International Standards.

1 Scope This Japanese Industrial Standard specifies the grain sizes of abrasives for grinding wheel and for other general use, which are artificial abrasives as specified in **JIS R 6111**.

Remarks : The International Standards corresponding to this Standard are as follows.

ISO 8486-1 : 1996 *Bonded abrasives—Determination and designation of grain size distribution—Part 1 : Macrogrits F4 to F220*

ISO 8486-2 : 1996 *Bonded abrasives—Determination and designation of grain size distribution—Part 2 : Microgrits F230 to F1200*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

JIS R 6002 *Testing method for bonded abrasive grain size*

JIS R 6111 *Artificial abrasives*

3 Classification of grain sizes Grain sizes are classified as shown in Table 1 to Table 3 in accordance with their ranges and grain size distribution.

Table 1 Class of macrogrit

Division	Class of grain size								
Macrogrit	F 4	F 5	F 6	F 7	F 8	F 10	F 12	F 14	F 16
	F 20	F 22	F 24	F 30	F 36	F 40	F 46	F 54	F 60
	F 70	F 80	F 90	F 100	F 120	F 150	F 180	F 220	

Remarks : Grain size is designated as "F ○○".

Table 2 Class of microgrit for general abrasives

Division	Class of grain size					
Microgrit	F 230	F 240	F 280	F 320	F 360	F 400
	F 500	F 600	F 800	F 1000	F 1200	

Table 3 Class of microgrit for precision polishing

Division	Class of grain size						
Microgrit	# 240	# 280	# 320	# 360	# 400	# 500	# 600
	# 700	# 800	# 1000	# 1200	# 1500	# 2000	# 2500
	# 3000	# 4000	# 6000	# 8000			

Remarks : Grain size is designated with the numerals followed with "No.".

4 Grain size distribution The grain size distribution shall follow Table 4 to Table 8.

The numbers expressing grain size distribution shown in each Table are those measured by the methods specified in **JIS R 6002**.

Table 4 Grain size distribution of macrogrits

Grain size	Test sieve through which 100 % of sample must pass (first stage)		Test sieve on which a definite quantity of sample may remain and that quantity (second stage)			Test sieve on which a definite quantity or more of sample must remain and that quantity (third stage)			Two test sieves on which a definite quantity or more of sample in total must remain and that quantity (third stage and fourth stage)					Test sieve through which 3 % of the sample at the most may pass (fifth stage)	
	mm	μm	mm	μm	%	mm	μm	%	mm		μm		%	mm	μm
F 4	8.00	—	5.60	—	20	4.75	—	40	4.75	4.00	—		70	3.35	—
F 5	6.70	—	4.75	—	20	4.00	—	40	4.00	3.35	—		70	2.80	—
F 6	5.60	—	4.00	—	20	3.35	—	40	3.35	2.80	—		70	2.36	—
F 7	4.75	—	3.35	—	20	2.80	—	40	2.80	2.36	—		70	2.00	—
F 8	4.00	—	2.80	—	20	2.36	—	45	2.36	2.00	—		70	1.70	—
F 10	3.35	—	2.36	—	20	2.00	—	45	2.00	1.70	—		70	1.40	—
F 12	2.80	—	2.00	—	20	1.70	—	45	1.70	1.40	—		70	1.18	—
F 14	2.36	—	1.70	—	20	1.40	—	45	1.40	1.18	—		70	1.00	—
F 16	2.00	—	1.40	—	20	1.18	—	45	1.18	1.00	—		70	—	850
F 20	1.70	—	1.18	—	20	1.00	—	45	1.00	—	—	850	70	—	710
F 22	1.40	—	1.00	—	20	—	850	45	—		850	710	70	—	600
F 24	1.18	—	—	850	25	—	710	45	—		710	600	65	—	500
F 30	1.00	—	—	710	25	—	600	45	—		600	500	65	—	425
F 36	—	850	—	600	25	—	500	45	—		500	425	65	—	355
F 40	—	710	—	500	30	—	425	40	—		425	355	65	—	300
F 46	—	600	—	425	30	—	355	40	—		355	300	65	—	250
F 54	—	500	—	355	30	—	300	40	—		300	250	65	—	212
F 60	—	425	—	300	30	—	250	40	—		250	212	65	—	180
F 70	—	355	—	250	25	—	212	40	—		212	180	65	—	150
F 80	—	300	—	212	25	—	180	40	—		180	150	65	—	125
F 90	—	250	—	180	20	—	150	40	—		150	125	65	—	106
F 100	—	212	—	150	20	—	125	40	—		125	106	65	—	75
F 120	—	180	—	125	20	—	106	40	—		106	90	65	—	63
F 150	—	150	—	106	15	—	75	40	—		75	63	65	—	45
F 180	—	125	—	90	15	—	63	40	—		63	53	65	—	—
F 220	—	106	—	75	15	—	53	40	—		53	45	60	—	—

Table 5 Grain size distribution of microgrits for general abrasive (photosedimentation method)

Unit : μm

Grain size	Particle diameter at 3 % point of cumulative height (d_s – 3 value)	Particle diameter at 50 % point of cumulative height (d_s – 50 value)	Particle diameter at 94 % point of cumulative height (d_s – 94 value)
F 230	82 max.	53.0±3.0	34 min.
F 240	70 max.	44.5±2.0	28 min.
F 280	59 max.	36.5±1.5	22 min.
F 320	49 max.	29.2±1.5	16.5 min.
F 360	40 max.	22.8±1.5	12 min.
F 400	32 max.	17.3±1.0	8 min.
F 500	25 max.	12.8±1.0	5 min.
F 600	19 max.	9.3±1.0	3 min.
F 800	14 max.	6.5±1.0	2 min.
F 1000	10 max.	4.5±0.8	1 min.
F 1200	7 max.	3.0±0.5	1 min.(1)

Note (1) This is particle diameter at 80 % point of cumulative height (d_s – 80 value).

Table 6 Grain size distribution of microgrits for general abrasive (Sedimentation method)

Unit : μm

Grain size	Particle diameter at 3 % point of cumulative height (d_s – 3 value)	Particle diameter at 50 % point of cumulative height (d_s – 50 value)	Particle diameter at 95 % point of cumulative height (d_s – 95 value)
F 230	77 max.	55.7±3.0	38 min.
F 240	68 max.	47.5±2.0	32 min.
F 280	60 max.	39.9±1.5	25 min.
F 320	52 max.	32.8±1.5	19 min.
F 360	46 max.	26.7±1.5	14 min.
F 400	39 max.	21.4±1.0	10 min.
F 500	34 max.	17.1±1.0	7 min.
F 600	30 max.	13.7±1.0	4.6 min.
F 800	28 max.	11.0±1.0	3.5 min.
F 1000	23 max.	9.1±0.8	2.4 min.
F 1200	20 max.	7.6±0.5	2.4 min.(1)

Note (1) This is particle diameter at 80 % point of cumulative height (d_s – 80 value).

Table 7 Grain size distribution of microgrits for precision polishing (Sedimentation method)

Unit : μm

Grain size	Particle diameter of the largest grain (d_s – 0 value)	Particle diameter at 3 % point of cumulative height (d_s – 3 value)	Particle diameter at 50 % point of cumulative height (d_s – 50 value)	Particle diameter at 94 % point of cumulative height (d_s – 94 value)
# 240	127 max.	90 max.	60.0±4.0	48 min.
# 280	112 max.	79 max.	52.0±3.0	41 min.
# 320	98 max.	71 max.	46.0±2.5	35 min.
# 360	86 max.	64 max.	40.0±2.0	30 min.
# 400	75 max.	56 max.	34.0±2.0	25 min.
# 500	65 max.	48 max.	28.0±2.0	20 min.
# 600	57 max.	43 max.	24.0±1.5	17 min.
# 700	50 max.	39 max.	21.0±1.3	14 min.
# 800	46 max.	35 max.	18.0±1.0	12 min.
# 1000	42 max.	32 max.	15.5±1.0	9.5 min.
# 1200	39 max.	28 max.	13.0±1.0	7.8 min.
# 1500	36 max.	24 max.	10.5±1.0	6.0 min.
# 2000	33 max.	21 max.	8.5±0.7	4.7 min.
# 2500	30 max.	18 max.	7.0±0.7	3.6 min.
# 3000	28 max.	16 max.	5.7±0.5	2.8 min.

Table 8 Grain size distribution of microgrits for precision polishing (Electrical resistance test method)

Unit : μm

Grain size	Particle diameter of the largest grain (d_v – 0 value)	Particle diameter at 3 % point of cumulative height (d_v – 3 value)	Particle diameter at 50 % point of cumulative height (d_v – 50 value)	Particle diameter at 94 % point of cumulative height (d_v – 94 value)
# 240	127 max.	103 max.	57.0±3.0	40 min.
# 280	112 max.	87 max.	48.0±3.0	33 min.
# 320	98 max.	74 max.	40.0±2.5	27 min.
# 360	86 max.	66 max.	35.0±2.0	23 min.
# 400	75 max.	58 max.	30.0±2.0	20 min.
# 500	63 max.	50 max.	25.0±2.0	16 min.
# 600	53 max.	43 max.	20.0±1.5	13 min.
# 700	45 max.	37 max.	17.0±1.3	11 min.
# 800	38 max.	31 max.	14.0±1.0	9.0 min.
# 1000	32 max.	27 max.	11.5±1.0	7.0 min.
# 1200	27 max.	23 max.	9.5±0.8	5.5 min.
# 1500	23 max.	20 max.	8.0±0.6	4.5 min.
# 2000	19 max.	17 max.	6.7±0.6	4.0 min.
# 2500	16 max.	14 max.	5.5±0.5	3.0 min.
# 3000	13 max.	11 max.	4.0±0.5	2.0 min.
# 4000	11 max.	8.0 max.	3.0±0.4	1.3 min.
# 6000	8.0 max.	5.0 max.	2.0±0.4	0.8 min.
# 8000	6.0 max.	3.5 max.	1.2±0.3	0.6 min.(2)

Note (2) This is particle diameter at 75 % point of cumulative height (d_v – 75 value).

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

Errata will be provided upon request, please contact:
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Graph based on JIS R6001